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ACROSS CANADA

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TO THE

ROCKY MOUNTAINS,

FROM A BOTANIST'S POINT OF VIEW.

BY

HENRY TUKE MENNELL, F.L.S.,

President of the Croydon Microscopical and Natural History Club.

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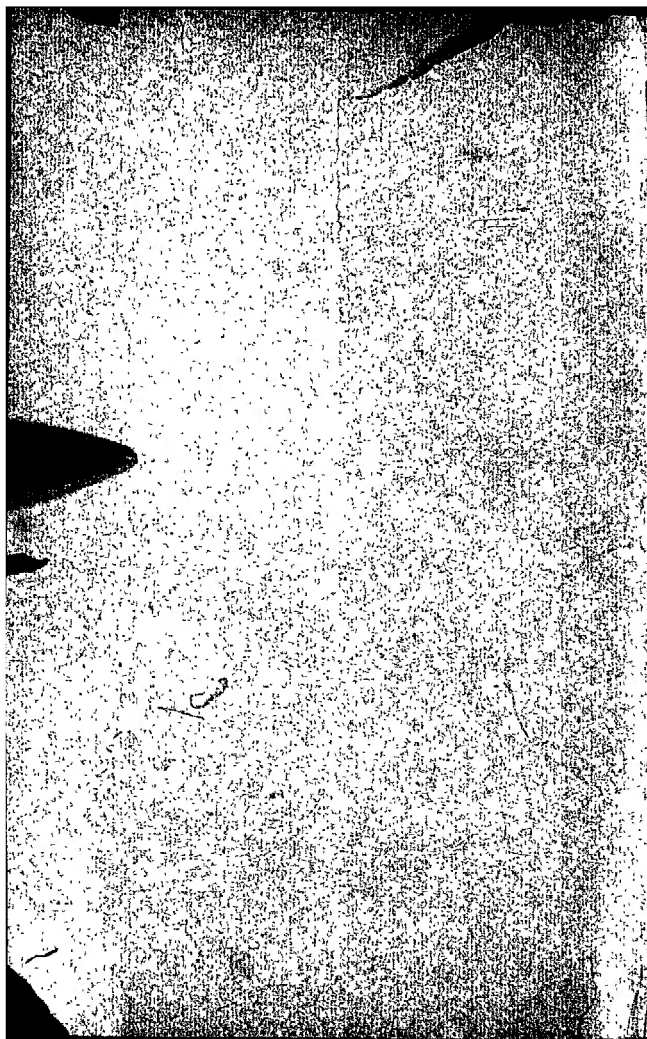
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Reprinted from the *Natural History Journal*.

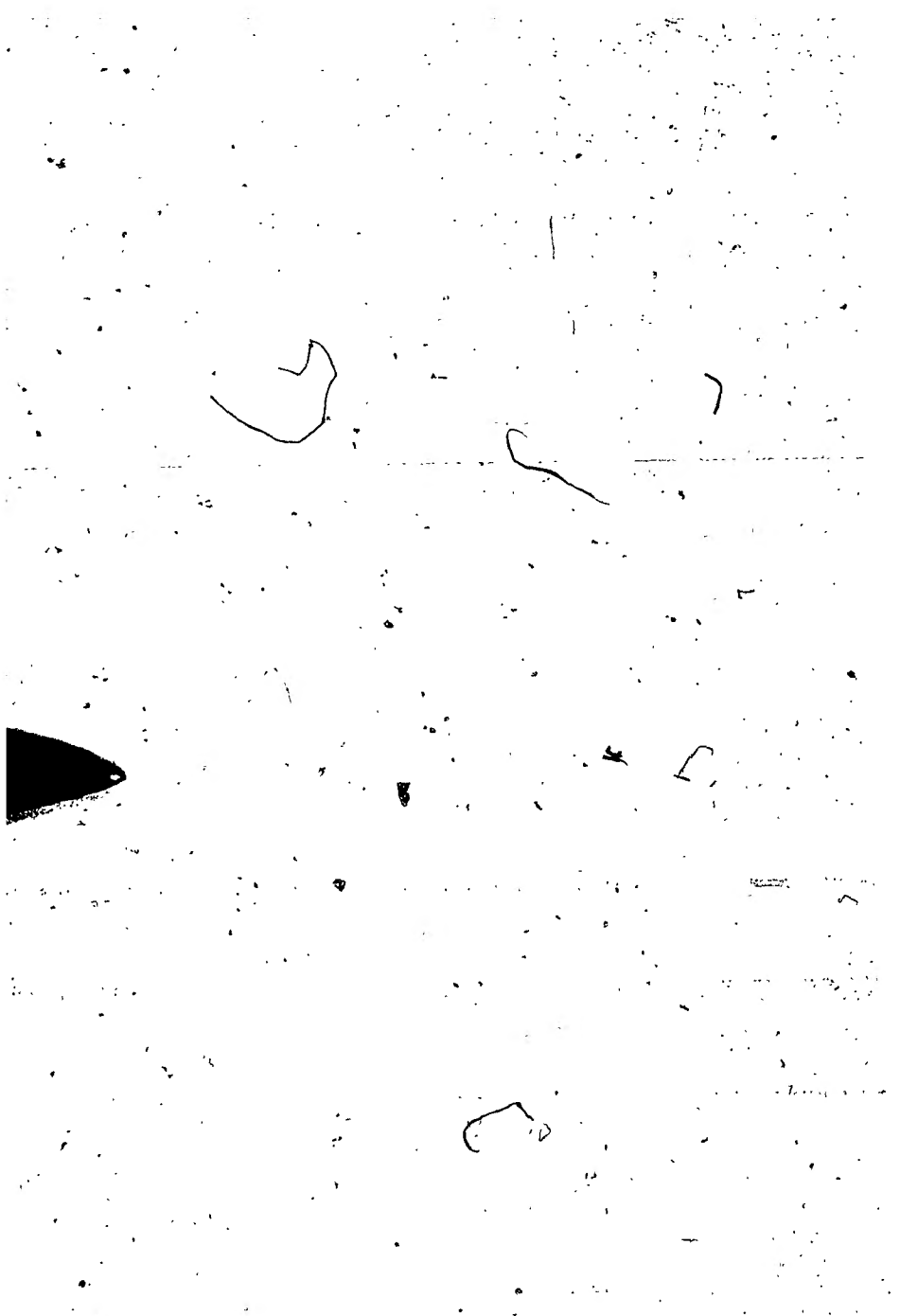


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ACROSS CANADA TO THE ROCKY MOUNTAINS, FROM A BOTANIST'S POINT OF VIEW.

1884

It was my privilege in the Autumn of last year to be one of the party selected for the Special Trip to the Rocky Mountains, organized and given by the Canadian Pacific Railway Company to 100 Members of the British Association.

In this grand excursion of 4500 miles, from Montreal to the Pacific slope of the Rocky Mountains and back again, the botanical features of the country more especially claimed my attention, and to these the remarks I have to offer to the readers of the *Natural History Journal* will be chiefly directed. The subject is a vast one, and in the limits of a brief paper it is necessary to be content with some one division of it, and yet a few general considerations, put as concisely as is consistent with clearness, seem a desirable, if not a necessary introduction.

To a keen English botanist visiting a strange and new (I should be sorry to be betrayed into using the word "foreign" in speaking of Canada,—so warmly, and so emphatically was the grand idea of the oneness of the empire brought before us throughout the Dominion from the moment when we set foot on its hospitable shores till, with mutual regrets, we parted from its truly English and loyal inhabitants),—to an English botanist, I repeat, the vegetation of a new country presents itself under two heads,—both equally interesting to him;—its resemblances to, and its differences from, that with which he is familiar.

If we take the North American continent from the Atlantic seaboard to the summit of the Rocky Mountains, we may divide it roughly into four belts. For our present purpose we will treat the United States and Canada as one.

The first is the cleared land of the older settled states. The flora of these cleared lands, which, in a comparatively recent past, were clothed with forests, is mainly derivative. We have all observed that the flora of dense woodlands or forests is sparse and poor, both in species and individuals; hence, as Professor Asa Gray has well put it, we had, when the forests were cleared, a botanic vacuum, abhorrent to Nature, as are other vacua. She therefore made haste to fill it up, with southern forms from the swamps and savannahs of the warmer regions of the Atlantic seaboard, with northern sub-alpine forms, and, especially, with European colonists; all these three classes are found here in extraordinary mixture. Wherever the land is cultivated, the weeds are to a large extent our own familiar garden pests, Shepherd's Purse, Snakeweeds, Plantain, &c., &c. The grasses, however, which

spring up in the streets and waste places, are mainly of the genera *Panicum*, *Setaria*, and *Digitaria*, in place of our familiar *Poa* and *Agrostis*. And here, as everywhere in America, the great composite families of Michaelmas Daisies (*Aster* and *Erigeron*), and Golden Rods (*Solidago*), take the place of our Ox-Eye Daisies, Hawkweeds, and Ragworts.

Another striking feature of this belt is the great variety of Trees which one may meet with in an ordinary ramble. In this country, or in Europe generally, a dozen or twenty species of trees would exhaust the list, but in America we should very likely encounter three or four times that number. An interesting explanation of this phenomenon is one connected with the oscillations of temperature and climate, to which the world has been subjected. In glacial periods, the trees were driven southward, both in Europe and America; but when a warmer era set in, in the former the Mediterranean presented an impassable barrier to their return northward, whilst in America, no such obstacle existing, they readily followed the warmer wave northwards again, so that we have not only all the hardier northern forms and families, but a vast number of southern and semi-tropical ones.

The second belt is the vast area of (we might almost call it) water-logged country, stretching from about Ottawa and the Great Lakes westward nearly to Winnipeg. Geological conditions account for the physical features in this as in many other instances. Whilst the first belt of which we have spoken consists chiefly of drifts and boulder clays, the second is occupied by the Laurentian rocks, which present externally very much the appearance of granites. As they are the oldest, so are they necessarily the most worn and eroded of the American rocks. They form low rounded hills, and come everywhere to the surface in bosses and hummocks, with worn depressions between them, from which there is little or no outfall or drainage. These depressions form a vast succession of lakes, varying in size from great inland seas to the merest pools. Others are occupied by bogs or swamps.

The greater part of this region presents no attraction to the settler beyond its timber, and is never likely to support any considerable population. Its botanical features are, however, of very great interest to the European botanist. Here is the home of the large class of flowering shrubs, chiefly ericaceous, which the gardener knows as *par excellence* "American plants," and for which he prescribes the peat bed. Anything more charming than one of these swamps in the late summer cannot well be imagined,—grand clumps of the carnivorous pitcher-leaved *Sarracenia*, a number of beautiful cyperaceous plants of the genera *Cyperus*, *Dulichium*, and *Carex* (some of the latter, as *C. lupulina*, and *C. tentaculata*, being especially striking), occupy the wetter portions, along with three species of *Osmunda* (*O. regalis*, *Claytoniana*, and *cinnamomea*). Other parts are clothed with the delicate, long trailing shoots of the Great American Cranberry, *Vaccinium macrocarpon*, and the lovely Snowberry, *Chiogenes hispidula*. A

dense growth of flowering shrubs and bushes of various sizes occupies the less watery ground; amongst these are several species of bilberry (*Vaccinium*)—some of them profusely covered with fruit, *Gaultheria*, *Cassandra*, *Andromeda*—the same species (*polifolia*) as our own, two or three *Kalmias* and *Ledums*. The trees in the more densely forested portions are individually poor, and very crowded, a really well-grown tree being rare. They are chiefly maples, poplars, birches, and ~~larches~~ *larches*; the first-named yields the splendid autumnal tints so often described by travellers, but for which, in their perfection, we were too early.

In this region, or belt of forest and swamp, I enjoyed two days botanising under exceptionally favourable circumstances. The first was at Ottawa, under the guidance of Prof. Macoun, of whom I shall have occasion to speak later on, and of Mr. Wm. Fletcher of the Parliament Library, Ottawa. The second was at Port Arthur, on the west shore of Lake Superior, where we were detained for a day by heavy rains, which had washed away a portion of the rails further west. The country here is intersected by basaltic or trap dykes, and on one of these I gathered with great interest *Potentilla fruticosa*, in just the locality and surroundings in which it grows in Teesdale. I afterwards saw this plant in great plenty on the banks of the Bow River, and gathered it also high up on the Rocky Mountains. In connexion with the day's botanising at Port Arthur, it is worth remarking how great a part in the dispersion of plants the railway plays. Here at Port Arthur I gathered a singular grass *Beckmannia erucaeformis*, which Prof. Macoun informed me had not previously been gathered so far east by many hundred miles. It had been brought down by the railway. On the other hand familiar Eastern and European weeds were found, following the track westward right up to the Rocky Mountains. The confusing and deceptive results of civilisation on the native Fauna and Flora are thus shown, and make it matter for congratulation that the great region from Nova Scotia to British Columbia had been more or less thoroughly explored, and its flora recorded by so eminent a botanist as Prof. Macoun, before it had suffered from these disturbing influences.

As we passed through a region of such country, west of Lake Superior, we frequently saw the birch-bark canoes of the Red Indians drawn up on the shores of the lakelets, and an occasional wigwam of the same material or of skins. With these the railway-track, the telegraph-posts, and the sumptuous Pullman Car seemed strangely out of keeping. Some noble streams with richly wooded banks, suggestive of a nobleman's residential estate, with salmon river and sport of all kinds, are passed between Port Arthur and the Lake of the Woods, notably the Kaministiquia; and someday, doubtless, the millionaires of Winnipeg will build mansions and carve out estates in this attractive region.

The third belt is the Prairie, entered upon not very far east of the city of Winnipeg, round which, in the alluvial basin of the Red River and the Assiniboine, is found its richest portion. This vast prairie region, which is some nine hundred miles across, consists

chiefly of black friable earth, resting on cretaceous clays. It is of inexhaustible fertility; some portions are known to have borne wheat-crops for forty years in succession without rest or manuring. To the settler it presents enormous advantages, in that it can be brought into immediate and profitable cultivation without any clearing. In fact the settler who secures his allotment in the early spring reaps his crop without difficulty in the early autumn of the same year. In the first season, the turf is simply turned over with the plough, and the seed sown among the unbroken clods, and an irregular, variable, but fairly good crop is thus obtained. Twenty-two bushels per acre was the yield from the "sod" on 4000 acres at the Bell Farm. In the second year, the plough is run through in the opposite direction; the soil is thus well broken up, and an excellent crop is the result. From twenty-five to thirty bushels of wheat per acre can then be relied upon. The disadvantages to the settler are;—first, the scarcity of timber, but this is supplied on fairly easy terms, now that the railway is in operation, and will be more so when the forests of the Rocky Mountains are fully tapped; second, the long and intense cold of the winter, though the calmness and dryness of the atmosphere, we were assured, made the nominally excessively low temperature of 20 to 40 below zero much less trying than the damper, but less intense cold of the Atlantic seaboard; third, the comparative isolation of the life so long as the population is as sparse and scattered as it is at present.

Of the future of this vast tract, it is impossible to exaggerate the prosperity and importance. The surplus population of the old world might here for generations find a home. But it is settlers that are wanted, not simply immigrants, and this distinction must be borne in mind. To be able to take up a homestead, and bring it into cultivation, presupposes a certain moderate amount of capital, habits of industry and forethought, and some agricultural knowledge. Hence this is not the country for the dregs of our great cities, that unhappy residuum, which seems to be the necessary product of wealth and progress.

Botanically, the region is of great interest. In the summer, it is a garden of brilliant and beautiful flowers. Many of the favourite flowers of our old cottage garden, and of those, which, under the name of "hardy perennials," figure in the recent "renaissance" of sensible gardening, here have their home. Rudbeckias, Sunflowers, Asters of many species, Goldenrods, Gaillardias, among Composites; many beautiful plants of the pea family, especially of the genera Astragalus, Oxytropis, Lupinus, and Petalostemon; Dwarf Enocheras (Evening primroses), Pentstemons, Lilies, Malvaceous plants, and a lovely dwarf rose (*Rosa blanda*), with a hundred others, cover the ground as with a carpet.

There are also on the prairie certain tracts in which the upper alluvium has been washed away and the Cretaceous underlying clays eroded; where also, in limited areas, there is no out-fall or drainage other than evaporation. In these districts the soil is distinctly saline,

and fresh, good water is difficult to procure. Areas of this kind are found from the Great Salt Lake of Utah, at intervals, all the way, in a north-easterly direction, to near Hudson's Bay. The flora in these parts is most distinct and peculiar. All the plants, without regard to their class and family, have a peculiar grey-green foliage. Many of the plants are aromatic, and hence the local name of "Sage Scrub." Here are found also two interesting plants of the Cactus tribe, *Mamillaria vivipara* and *Opuntia Missouriensis*.

Over all this great prairie region, especially in its western and north-western portions, great numbers of Red Indians still wander. In some parts they are settled in "Reserves," but more often they are nomads. We saw and visited numbers of their encampments, consisting of groups of eight to twenty wigwams. In the region traversed by the railway, the principal tribe is that of the Black-feet, divided into Northern Black-feet, Pegans, Sarcees, and Bloods, of whom "Crow-foot" is chief paramount. A Pow Wow, or gathering of the Black-feet, was arranged for our entertainment at Indian Head, when we made the acquaintance of the great chief above named, whose loyalty is now a matter of great importance, in the very unlooked-for difficulties which have recently arisen with the Half-breeds, and I have great hopes that a certain chest of tea which was purchased with the joint contributions of our party and formally handed to him by our leader, Sir Richard Temple, in the name of the British Association, will not have been without its influence in keeping Crowfoot straight in this crisis. These Half-breeds, descended from the early French trappers and voyageurs and Indian squaws, are physically one of the handsomest races I ever saw; but they are idle, treacherous, and cruel. The encroachment of the surveyor and the settler, the increasing scarcity of game of all kinds, and probably a somewhat high-handed dealing in regard to their real or imaginary squatting rights, are at the root of the revolt.

As regards game, the loss of the Buffalo or Bison is to the Indian and the Half-breed a grave calamity. A journey across the prairie shows the traveller how important a source of food and support this noble creature was, but a very few years ago. The prairie is literally strewn with its bones, chiefly skulls and horn-cores; and the deeply-worn tracks or ruts, which marked its regular routes to and from water and pasturage, are seen on every side. A few Antelope still remain, but they are now comparatively scarce. Immense quantities of water-fowl, ducks of numerous species, and wild geese, still abound. The mammalian fauna chiefly consists of three or four species of small rodents,—ground squirrels, locally known as "Chip Munks." Birds of prey are extremely numerous. One early morning, looking out of the window of my sleeping berth, I counted 15 large hawks within a very short distance of the rail. These were chiefly Buzzards of four species, and Harriers; the Peregrine Falcon or Duck Hawk is also very frequently seen. Large flocks of a starling with a long tail, locally called Blackbirds (*Quiscalus versicolor*), and of a crow (*Corvus Americanus*), are seen in the cultivated portions, and the English

Sparrow has got westward beyond Winnipeg to Brandon, and will doubtless soon achieve the passage of the Rocky Mountains.

From Lake Superior to the foot of the Rocky Mountains, a distance of nearly 1400 miles, there is a rise of about 1500 feet, in three steps or lines of low hills, mounting from one apparently perfectly level plateau to another. A carriage and pair could be driven without difficulty in almost any direction for hundreds of miles over the turf, except where the deeply-worn "creeks," or beds of streams, mostly tributaries of the Saskatchewan, present an obstacle.

The fourth belt is the Mountain Range itself, which, looking at their distinct geological character, is more correctly divided into two sections, the Foot Hills and the actual range of the Rocky Mountains; but of the Botany of the first-named I am unable to speak. These Foot Hills commence at Calgary on the line of the railway. They are of cretaceous formation, covered with turf and grass like our Downs, are well watered by many beautiful glacier-fed streams, such as the Bow River, the Peace River, &c. They are beginning to be occupied as Cattle Ranches, and Horse Ranches, and have a great future before them. Though the cold of winter is intense, the snowfall is extremely small and the climate very dry, so that it is said, horses and cattle can feed themselves by scratching away the few inches of snow, all through the winter.

It was evening and night when, in a heavy snowstorm, we crept up the mountains, following the course of the Bow River. At the summit of the pass, at a little station and hamlet called Laggan, we passed the night in the cars. The morning broke clear, bright, and frosty, and it was of a day's botanising on the mountains, round the Kicking Horse Pass, from 6000 to 9000 feet above the sea, that I had intended chiefly to speak. From this intention I have been so diverted on the way, that I must compress into small compass what I have to say of this Alpine Flora. Our party had the advantage of the presence of the distinguished botanist to the Survey of Canada, Professor John Macoun, and separating ourselves from the main party, we two struck directly up the mountains, and carefully recorded all the plants we met with during the day.

The first point that strikes the traveller are the splendid coniferous trees. These chiefly belong to three species of *Abies* or Spruce (*Douglasii*, *Engelmanni*, and *subalpina*). There are also two Pines (*contorta* and *albicaulis*), and a Larch (*L. Lyallii*). Many of these attain an enormous height, and are noble, well-grown trees. The reckless destruction of them by burning, to open out the track of the railway, is most grievous, and sadly disfigures the landscape in the near neighbourhood of the line. Avalanches have also cleared for themselves great tracks through the forests. The older of these avalanche clearings are now clothed with a vegetation more attractive to the botanist than that of the denser forest. In the latter, however, are some charming plants, as for example, a delicate creeping *Rubus* (*R. pedatus*), with Tormentilla-like growth and single flowers on slender

pedicels, *Listera cordata* (pleasantly reminding me of our York school excursions to Langwith pine-woods), the beautiful *Pyrola uniflora*, *Veratrum viride*, and the rare Scotch fern, *Cystopteris montana*. As we ascended higher, above the tree line, we came into a thoroughly Alpine Flora, which was, in the main, perfectly familiar to me. After passing for many days across the prairie, scarcely seeing a European plant, it was with great delight and surprise that I found myself once more amongst old friends and familiar faces.

The Alpine Flora of all the northern continents is remarkably similar, strikingly so when compared with that of the Lowlands. It is probably, therefore, the survival of a very ancient condition of things, and of a vegetation which covered all the northern hemisphere when its climate was glacial or boreal. With warmer conditions, the more vigorous but less hardy vegetation of the south has driven those which we now call alpine plants up the mountains, where they still survive in scattered isolated situations, the evidences and relics of a once generally distributed flora. Thus, on the very summit of the White Mountains, in the Eastern States, is found a little group of Alpines (Scotch and Swiss species), occupying a few feet of ground, and surrounded by a flora altogether distinct and southern.

After ascending a couple of thousand feet above the pass, we paused to enjoy the scene around us. The pines below and the rocks above were still silvered over with the snow of the previous night, rapidly, however, disappearing in the brilliant sunshine. Below the forest lay the pass,—a deep depression in the range; on one hand the streams were flowing to the Bow River and Hudson's Bay, and on the other, from the Kicking Horse Lake just below us, a fine mountain stream was hastening to the Pacific. In front of us, across the pass, was first the forest belt, then mountains of strangely contorted rocks, twisted and shattered like the schists of the Matterhorn-range. Above these again, a vast range of snowy peaks, amongst which the forms of the Matterhorn, the Little Matterhorn, and the Breithorn, were closely reproduced. Closing the view westward, the snow peaks of the second or Selkirk Range of the Rockies were clear in the distance.

At every step some fresh plant was gathered. Of well-known, though rare Scotch and English Alpines I may name *Silene acaulis*, *Saxifraga oppositifolia*, *aizoides*, and *rivularis*, *Dryas octopetala*, *Oxyria reniformis*, *Veronica alpina*, *Linnaea borealis*, *Oxytropis campestris*, *Saussurea alpina*; and amongst Ferns, the Holly, the Parsley, the Oak, *Asplenium viride*, and *Lycopodium annotinum*. Altogether we recorded during the day about 190 species, of which about 60, or nearly one-third, were British. The true Heaths are entirely absent even here, as they are throughout America, but their place is taken by three closely allied plants of the genus *Menziesia* or *Bryanthus*, which, when in flower, are of great beauty. We gathered all of them, but they were unfortunately past flowering.

We saw but few birds, nor were we fortunate enough to see the Rocky Mountain Sheep, although we thought we heard it, and cer-

tainly saw its leavings. Amongst the loose stones or rocks, which might have belonged to an old Moraine, we noticed a great number (I counted twelve in an area of a few yards) of *caches* of neatly cut shoots of plants, shrubs, and grass, all about three or four inches long, carefully and regularly deposited in the cavities, under the sheltered side of stones. They were evidently the work of a small rodent, for winter supplies, whether of the Alpine Hare, or of one of the Ground Squirrels, I cannot say.

On our return to the cars, we found that the Geologists of the party had, by the discovery of previously unknown fossils (trilobites), fixed the relative age and position of the rocks composing the range; a matter of very considerable interest and importance.

We slept in the cars as they rested at the station, and descended the pass in the very early morning; we had seen little of the scenery as we ascended, and it was by the thoughtful arrangement of Mr. Egan, the Manager of the Canadian Pacific, who accompanied us, that the opportunity of doing so was given us in descending.

Arrived at Calgary, and on to the prairie beyond it, we looked back at the mountains, and the prospect was one which will not easily be forgotten by any of us;—an unbroken range of 'snowy peaks, brilliant in the early morning sun, stretched across nearly two-thirds of the visible horizon. The panorama of the Alps from Berne cannot compare with this for grandeur, or for the extent of the snowy range. Scarcely any of these grand peaks have been ascended or are even named, and with the completion of the railway, and the erection of a decent hotel at Laggan, a new field for the enterprise of my fellow-members of the Alpine Club will be opened up.

[A list of the plants observed during the day among the mountains, as recorded at the time and since confirmed by Professor Macoun, is appended; it is of special interest from its close European relations.]



LIST OF PLANTS,

Observed during a day amongst the Rocky Mountains.

Anemone parviflora, Mx.
Thalictrum dioicum, L.
Trollius laxus, Salisb.
Aquilegia flavescens, Watson
**Camelina sativa*
Draba alpina
 **incana*
Viola sarmentosa
**Empetrum nigrum*
**Silene acaulis*, L.
Lychnis apetala, L.
 clata
**Arenaria verna*, var. *hirta*, Feenzl.
 Rossi, R. Br.
Stellaria borealis, Bigel.
Cerastium Behringianum, Gray
Acer glabrum, Torr.
**Oxytropis campestris*, DC.
Hedysarum boreale, Nutt.
Prunus Pennsylvanica, L.
Spiræa betulæfolia, Pall.
Dryas integrifolia, Vahl.
 **octopetala*, L.
Fragaria Virginiana, Ehrh.
**Potentilla fruticosa*, L.
 **procumbens*, Nutt.
 diversifolia, Lehm.
Rubus Nutkanus, Mocino
 pedatus, Smith
 strigosus, Mx.
Rosa blanda, Ait.
Pyrus sambucifolia, Ch. & Sc.
Ribes lacustre, Poir.
 prostratum, L'Her.
**Parnassia palustris*, L.
 himbriata, Banks
**Saxifraga rivularis*, L.
 **aizoides*, L.
 bronchialis, L.
 Lyallii
 controversa, Stenb.
Mitella nuda, L.
 pentandra, Hook.
Tiarella trifoliata, L.
**Epilobium angustifolium*, L.
 latifolium, L.
 **origanifolium*, Lam.
Osmorrhiza nuda, Torr.
Cornus Canadensis, L.
**Linnæa borealis*, Gronov.

Loniceræ involucrata, Banks
Sambucus glauca
**Galium boreale*, L.
Valeriana sylvatica, Rich.
Nardosmia palmata, Hook.
Aster conspicuus, Lindl.
 Lindleyanus, T. & G.
 montanus, Rich.
**Erigeron acris*, L.
 uniflorum, L.
**Solidago Virga-aurea*, L.,
 var. *multiradiata*, T. & G.
**Achillæa Millefolium*, L.
Antennaria alpina, Gærtn.
 Carpathica, R. Br.
 racemosa, Hook.
Senecio triangularis, Hook.
 aureus, L.
 var. *obovatus*, T. & G.
 var. *balsamifera*
Arnica Chamissonis, Less.
 latifolia, Bong.
 alpina
**Saussurea alpina*, DC.
**Taraxacum Dens-leonis*, Desb.
Crepis nana, Rich.
Macrorrhynchus dasycephalum
 troximoides, T. & G.
**Campanula rotundifolia*, L.
**Vaccinium Vitis-Idæa*, L.
 **Myrtillus*, L.
 var. *microphyllum*.
**Arctostaphylos Uva-ursi*, Spreng.
 **alpina*, Spreng.
Menziesia Grahamii, Hook.
 glanduliflora, Hook.
 globularis, Salisb.
Ledum latifolium, Ait.
Rhododendron albiflorum, Hook.
**Pyrola secunda*, L.
 **rotundifolia*, L.
**Moneses uniflora*, Gray
Androsace septentrionalis, L.
**Pinguicula grandiflora*, Sm.
**Scrophularia nodosa*, L.
Pentstemon venustus
**Veronica alpina*, L.
Castilleja pallida, Kunth.
**Rhinanthus Crista-galli*, L.
Pedicularis racemosa, Dougl.

*Gentiana Amarella, L.
 *Polygonum viviparum, L.
 *Rumex Acetosella, L.
 *Oxyria digyna, Campd.
 Shepherdia argentea, Nutt.
 Canadensis, Nutt.
 Comandra livida, Richardson
 Betula occidentalis, Hook.
 glandulosa, Mx.
 Alnus incana, Willd.
 Salix arctica, R. Br.
 Barrattiana, Hook.
 candida, Willd.
 glauca, L.
 *herbacea, L.
 vestita, Pursh.
 Populus tremuloides, Michx.
 balsamifera, L.
 Pinus contorta, Dougl.
 albicaulis, Engelm.
 Abies Douglasii, Lindl.
 Engelmanni, Parry
 subalpina
 Larix Lyallii, Parl
 Taxus baccata, L., var. Canadensis, Gray
 *Juniperus communis, L.
 var. alpina, L.
 Sabina, L., var. procum-
 bens, Pursh.
 *Listera cordata, R. Br.
 *Calypso borealis, Salisb.
 Zygadenus glaucus, Nutt.
 Veratrum viride, Ait.
 Toxifieldia glutinosa, Willd.
 *palustris, Huds.
 Streptopus amplexifolius, DC.
 Smilacina racemosa, Desf.
 var. amplexicaulis, Gr.
 stellata, Desf.
 Stenanthium occidentale, Watson
 Luzula parviflora, Desv.
 var. melanocarpa, Gr.
 spadicea, DC.

*Juncus Balticus, Dethard,
 var. montanus, Englm.
 *Carex aquatilis, Wahl.
 *atrata, L.
 *capillaris, L.
 glareosa, Wahl.
 nardina, Dew.
 *pulla, Good.
 scirpoidea, Michx.
 Calamagrostis Canadensis, Beauv.
 *stricta, Trin.
 Luksdorffii
 Stipa Richardsonii, Link.
 *Koeleria cristata, Pers.
 *Poa nemoralis
 *pratensis, L.
 alpina, L.
 *caesia, Smith
 Bromus brevis-aristatus, Thurb.
 *Triticum repens, L.
 dasystachyum, Gray
 aegilpodoides
 Elymus Sibiricus, L.
 *Aira caespitosa, L.
 Trisetum subspicatum, Beauv.
 var. molle, Gray
 *Equisetum sylvaticum, L.
 *variegatum, Schleich
 scirpoides, Mx.
 Allosorus acrostichoides, Spreng.
 *Asplenium viride, Hudson
 *Phegopteris polypodioides, Fee.
 *Aspidium Lonchitis, Swz.
 *Cystopteris fragilis, Bernh.
 *montana, Bernh.
 Woodsia glabella, R. Br.
 *scopulina, D. C. Eat.
 *Lycopodium annotinum, L.
 Selaginella rupestris, Spring.

* NOTE.—British Species are distinguished by an asterisk.